# TABLE OF CONTENTS

1. Introduction .......................................................... 2
2. Prior to Installation .................................................. 2
   2.1 Installer Responsibilities ...................................... 2
   2.2 Pre-installation Checklist ..................................... 4
   2.3 Safety Explanations ............................................. 4
   2.4 Warnings .......................................................... 4
   2.5 Identifying Your Model ....................................... 5
3. Ride Height .......................................................... 5
   Calculating Ride Height .......................................... 5
4. Frame Width .......................................................... 6
5. Installation ............................................................ 7
6. Axle Installation ..................................................... 11
7. Axle Alignment ....................................................... 14
   7.1 Weld Collar Style ............................................... 14
   7.2 Eccentric Collar Style ........................................ 16
8. Air Controls .......................................................... 17
9. Air Pressure vs. Load ............................................... 18
10. Torque Requirements ............................................... 19
   10.1 Torque Guidelines ............................................ 19
   10.2 Torque Guidelines – U-Bolts ................................. 19
   10.3 Torque Guidelines – Air Springs/Fittings .................. 20
1. Introduction

This publication is to provide information for installation of the Watson & Chalin Auxiliary Liftable Air Ride Suspension Product Line and is intended for use only with this Product Line.

This manual includes installation information on Watson & Chalin model numbers:

AL2200

This manual assumes that the proper suspension has been chosen for the application. For information concerning suspension selection, contact Watson & Chalin Mfg., Inc.

Watson & Chalin reserves the right to change its products or manuals at any time. Contact Watson & Chalin at 1.800.445.0736 for information on recent changes to products.

Defective components should be returned to Watson & Chalin with a pre-arranged Returned Goods Authorization (RGA) number through the warranty department. If the defect is in compliance with warranty conditions, the defective component may then be replaced.

If the part is damaged in shipment, please contact the freight company to file a claim. The freight company is responsible for any damage to components during shipment.

---

**IMPORTANT**

The entire manual must be read and understood before proceeding with installation or service of any components.

---

This manual should be used in conjunction with corresponding drawings that come with Watson & Chalin suspensions upon delivery.

The vehicle manufacturer must approve any changes to the vehicle frame before the changes are done. Cutting or altering the vehicle’s frame is normally not permitted by the manufacturer and affects the manufacturer’s warranty coverage.

---

2. Prior to Installation

2.1 Installer Responsibilities

The installer of the suspension system must:

- Ensure that proper safety practices are followed during installation of the auxiliary axle suspension system. This includes disconnection of the vehicle’s electrical and air systems, proper chocking of the vehicle’s tires and immobilization of the vehicle, proper support of all vehicle and auxiliary axle suspension system components and proper use of personal protective equipment. Failure to follow proper safety practices can result in accidental activation, deactivation, and/or movement of the vehicle or auxiliary axle suspension system which can result in injury and/or death.

- Ensure proper installation of the auxiliary axle suspension system. Improper installation may cause premature failure of the auxiliary axle suspension system, its components, and/or other vehicle components, can lead to an accident, injury, and/or death, and will void the suspension system warranty.

- Ensure proper installation and performance of the brake system and all brake system components. Brake installation must comply with FMVSS121 specifications. Improper installation can lead to an accident, injury and/or death.

- Ensure that the vehicle will function properly under the increased weight and loading that will exist when the auxiliary axle suspension system is installed.

- Ensure the auxiliary axle suspension system is located to provide proper vehicle weight distribution when loaded.
The weight carried by each suspension system must not exceed its rated capacity. Improper weight distribution may cause premature failure of the auxiliary axle suspension system, its components, and/or other vehicle components.

- Ensure the ride height of the auxiliary axle suspension in the loaded condition is within the range specified on the suspension system drawing. Incorrect ride height may cause premature failure of the auxiliary axle suspension system, its components, and/or other vehicle components.

- Ensure the proper amount of tire-to-ground clearance exists for the intended application. Improper tire to ground clearance may cause premature failure of the auxiliary axle suspension system, its components, and/or other vehicle components.

- Ensure that proper clearances exist between the auxiliary axle suspension system and all other vehicle components, including the drive shaft. Improper clearance may cause premature failure of the auxiliary axle suspension system, its components, and/or other vehicle components.

- Ensure that any welding on, or of, the auxiliary axle suspension system components occurs only where specified by Watson & Chalin Mfg., Inc. and within this manual. Any welding on, or of, components that is not specified by Watson & Chalin Mfg., Inc. or in this manual may cause premature failure of the auxiliary axle suspension system, its components, and/or other vehicle components.

- Verify and properly center the axle on the suspension system and in the vehicle chassis. Improper centering of the axle may cause premature failure of the auxiliary axle suspension system, its components, and/or other vehicle components.
2.2. Pre-installation Checklist

Before beginning the installation, the following items must be verified:

- Verify the vehicle is on a flat level surface that is capable of supporting the vehicle weight.
- Verify the vehicle’s wheels have been properly chocked and the vehicle properly immobilized so that it cannot move during installation.
- Verify that the vehicle’s electrical system has been disconnected so that the auxiliary axle suspension system cannot be accidentally activated or deactivated during installation or maintenance.
- Verify that all required personal protective equipment is available, and is free from damage or defects that would impair proper function.
- Verify that all required tools and equipment are available and are free from damage or defects that would impair proper function.
- Verify that the auxiliary axle suspension system matches the specification provided by your production or engineering department.
- Verify that the frame width is within the allowable mounting range of the auxiliary axle suspension system and adjust the suspension if necessary. See the Frame Width section.
- Verify that the vehicle’s cross members are correctly positioned and capable of supporting the loads from the auxiliary axle suspension system.
- Verify that the auxiliary axle suspension system will not interfere with any existing frame rail bracketry, mounting hardware, electrical, air or fuel lines, or any other vehicle components.
- Verify that the auxiliary axle suspension system will not interfere with the vehicle’s driveshaft. Refer to the auxiliary axle suspension system drawing as required.

- Verify the correct mounting hardware, SAE Grade 8, is available. Mounting hardware is not provided by Watson & Chalin Mfg., Inc. It is the responsibility of the suspension installer to ensure the proper mounting hardware is specified and installed.

2.3 Safety Explanations

Watson & Chalin uses the following types of notes to warn against possible safety problems and to give information that helps to prevent damage to equipment.

- **IMPORTANT**
  An important message indicates a procedure that should be followed exactly.

- **WARNING**
  A warning indicates hazards or unsafe practices that could result in severe personal injury or death, if the procedure is not followed exactly.

- **WARNING**
  All safety statements should be read carefully to prevent bodily injury, to assure that parts are assembled properly and to retain the manufacturer’s warranty.

2.4 Warnings

- **WARNING**
  Proper axle attachment is required for safe operation of the vehicle.

- **WARNING**
  No alteration of any Watson & Chalin suspension components is permitted without proper authorization from qualified Watson & Chalin personnel.

- **WARNING**
  No welding of any suspension components is permitted except when specified by Watson & Chalin.
2.5 Identifying Your Model

**IMPORTANT**
It is important that you know what model number has been assigned to your assembly in case you ever need to contact Watson & Chalin.

**Identification Plate**

Each suspension assembly has an identification plate located on the left side of the suspension assembly (driver’s side of the vehicle – see Figure 1). The plate includes the model number, serial number and capacity in pounds for the assembly. It is important to record the model and serial number for future reference.

---

3. Ride Height

Watson & Chalin defines “ride height” as the distance between the suspension mounting surface (the bottom of the vehicle frame rail in the example below) and the spindle center of the auxiliary axle suspension system (See Figure 2). Correct installation requires that the suspension’s ride height be within the range specified on the auxiliary axle suspension system drawing when the following occurs:

- The vehicle is loaded.
- The auxiliary axle suspension system’s tires are in contact with the ground.
- The air spring pressure is properly set to carry the weight on the auxiliary axle suspension system.
- The weight the auxiliary axle suspension system is carrying is equal to or less than its rated capacity.

**IMPORTANT**
A correct installation requires that the suspension ride height be within the range specified on the corresponding drawing when the vehicle is in its loaded condition.

Watson & Chalin provides several variations of AL series suspension systems to accommodate different vehicle ride heights and capacities.

**Calculating Ride Height**

Proper Ride Height is calculated with the following equation:

\[
\text{Ride Height} = \frac{A}{B} - C
\]

Figure 1

---

Figure 2
If the required run height is taller than the designed run height of the lift axle, a spacer may be required between the auxiliary axle suspension system’s frame brackets and upper bag plates, and the vehicle’s frame rails. For the AL2200 model suspension, a 3” spacer is the maximum allowed. If a spacer of more than 3” is required, contact Watson & Chalin Mfg., Inc. Customer Service or Engineering.

To determine the spacer thickness required, perform the following calculation:

\[
\text{A} \quad \text{Ground to Bottom of Vehicle Frame (loaded)} \quad _____
\]

\[
\text{B} \quad \text{Subtract Static Loaded Tire Radius} \quad - \quad _____
\]

\[
\text{C} \quad \text{Subtract Designed Ride Height} \quad - \quad _____
\]

\[
\text{Equals Required Spacer Thickness} \quad = \quad _____
\]

4. Frame Width

Unless a frame width was specified during the order process and the axle (if supplied) is fully welded into the suspension, a standard suspension system is set up for a 34” vehicle frame width with the axle only tack welded into the seats and the U-bolts “snugged” tight. (See Figure 3)

The standard suspension may be adjusted to fit frames from 33.5” wide to 34.5” wide by cutting the tack welds loose and repositioning the arm/axle seats to the appropriate amount for the required frame width. See instructions below.

The standard suspension cannot be mounted if the frame width exceeds 34.5”; however, the standard suspension can be mounted to a frame under 33.5” through the use of spacers. If spacers are used, equal thickness spacers must be used on each side to ensure the suspension remains be centered to the vehicle.

Vehicles with frame widths larger than 34.5” can be accommodated through Watson & Chalin Mfg., Inc.’s custom application engineering program. Contact Watson & Chalin Mfg., Inc. customer service or engineering for assistance and additional information.

To adjust the standard suspension for different frame widths between 33.5” and 34.5” proceed as follows:

1. Loosen and remove the U-bolts.
2. Carefully break or cut the tack welds, but DO NOT cut into the axle tube.
3. Adjust the trailing arm beams on the axle tube by moving them in or out the required distance.
4. Align the arm beams so that they are parallel to each other and perpendicular to the axis of the axle tube.
5. Tack the arm beams back into position.
6. Verify that the arm beams are parallel to each other and perpendicular to the axis of the axle tube.
7. Reinstall and snug the U-bolts.
8. Verify the suspension fits the frame rails properly and that the axle is centered in the chassis.
9. Verify required tire clearance at suspension and vehicle components (see Figure 4)
10. Refer to Page 11 for axle mounting instructions and specifications.

Figure 3

Tack Welds - these are not fully welded.
5. Installation

The following instructions are for installing the components of the Watson & Chalin AL Series Suspension systems. All model numbers in the series are installed using the same set of instructions. Watson & Chalin assumes that the correct auxiliary suspension and axle were chosen based on the individual design criteria.

The auxiliary axle suspension system must be installed with the proper amount of tire-to-ground clearance to ensure trouble free operation of the vehicle. If there is too much ground clearance, the suspension will not carry its share of the load, straining the other suspension components. When there is too little ground clearance or if the suspension is overloaded, the vehicle will bottom out while going over bumps and damage can be done to the suspension components or other components on the vehicle. Failure to correctly install the suspension may cause premature failure of the auxiliary axle suspension system, its components, and/or other vehicle components, and can lead to an accident, injury and/or death.

1. Locate the vehicle on a flat level surface.
2. Secure the vehicle so that it cannot move by chocking the vehicle’s drive tires fore and aft.
3. Determine the location of the auxiliary axle.
   3.1. Mark the desired axle centerline on the outside of the vehicle’s frame rail.
   3.2. Refer to the auxiliary axle suspension system drawing and mark the centerlines and boundary areas of the frame brackets and upper bag plates on the vehicle’s frame rails (See Figure 5).

Figure 4
4. Verify that the suspension system will not interfere with any existing frame rail bracketry, mounting hardware, electrical, air or fuel lines, or any other vehicle components.

5. Verify that the suspension system will not interfere with the vehicle’s driveshaft. Refer to the auxiliary axle suspension system drawing as required.

6. Review the suggested cross member locations (See Figure 6), and verify with the vehicle manufacturer that the chassis and cross members are capable of supporting the auxiliary axle suspension system.
6.1. If the frame rails and cross members are not capable of supporting the auxiliary axle suspension system they will have to be reinforced. It is the responsibility of the installer to properly reinforce the vehicle’s frame rails and cross members if required.

7. Verify the suspension is set to the proper frame rail width. See the Frame Width section.

8. Position the suspension system on the frame using the reference marks made in step 3.
   8.1. Clamp the frame brackets and upper frame brackets to the frame rails so that the suspension cannot move.
   8.2. The suspension system’s frame brackets and upper bag plates must sit flush to the side and bottom surfaces of the vehicle’s frame rails (See 8.3. Figure 7).

8.4. Failure to properly position the auxiliary axle suspension system properly will void the suspension system warranty and may cause premature failure of the auxiliary axle suspension system, its components, and/or other vehicle components.

8.5. Verify the suspension system is properly located.

9. Mark the mounting holes on the frame brackets and upper bag plates.
   9.1. Verify that there is no existing frame rail bracketry, mounting hardware, electrical, air or fuel lines, or any other vehicle components that will be damaged when drilling the frame brackets.
   9.2. Do not modify or alter the bottom or top flanges of the vehicle’s frame rail in any way. Do not bolt through, weld, cut or reinforce these flanges without verifying suitability of the modifications with the vehicle manufacturer first. Failure to do so may void the vehicle warranty.

**WARNING**

Welding, drilling or bolting through the bottom flange of the suspension frame or vehicle rails may void the manufacturer’s warranty.

10. Verify the suspension system is properly located, then drill two (2) 0.6875" (11/16")
diameter mounting holes through each frame bracket and the vehicle’s frame rails.

11. Install 0.625" (5/8") SAE Grade 8 fasteners in each mounting hole, and snug tighten the fasteners. Verify that the bolts protrude through the nuts by at least three (3) full threads.

12. Verify the suspension system is properly located, then drill the remaining mounting holes in the frame brackets. Eight (8) holes minimum are required per frame bracket (See Figure 8).

13. Install 0.625" (5/8") SAE Grade 8 fasteners in the remaining frame bracket mounting holes, and torque all fasteners to specification (See Section 10 Torque Requirements). Verify that all bolts protrude through the nuts by at least three (3) full threads.

14. Verify the suspension system is properly located, then drill (2) 0.6875" (11/16") diameter mounting holes through each upper air spring plate and the vehicle’s frame rails.

15. Install 0.625in (5/8) SAE Grade 8 fasteners in each mounting hole, and snug tighten the fasteners. Verify that the bolts protrude through the nuts by at least three (3) full threads.

16. Torque the frame bracket and upper air spring plate mounting fasteners to specification (See Section 10 Torque Requirements).

17. Install the cross member and torque the cross member fasteners to specification (See Section 10 Torque Requirements) or weld the cross member in place as required (See Figure 9).
6. Axle Installation

The axle must be correctly centered in the suspension system for proper operation to occur. Centering of the axle must be completed before the vehicle can be operated. Failure to properly center the axle may cause premature failure of the auxiliary axle suspension system, its components, and/or other vehicle components, and can lead to an accident, injury and/or death.

1. Locate the vehicle on a flat level surface.
2. Secure the vehicle so that it cannot move by chocking the vehicle’s drive tires fore and aft.
3. Measure the distance between the arm beam assemblies and inside drum face (See Figure 10) or other fixed location on the axle ends.

---

**Figure 10**

3.1. Measure dimensions X1 and X2 at the front edge and rear edge of the brake drums. Measure from the outside face of the axle seat to the inside face of the brake drum.
3.2. If the axle is properly centered, the front and rear measured dimensions on one side of the suspension will be the same, and dimension X1 will equal dimension X2 plus or minus (+/-) 0.125in (1/8).
3.3. If the axle is not properly centered, dimension X1 will not equal dimension X2, and the axle position must be adjusted.
4. To center the axle proceed as follows:
   4.1. Secure the axle so that it may not fall from
   the suspension when the U-bolts are
   removed and the tack welds are cut, but
   may be adjusted for centering.
   4.2. Remove the U-bolts.
   4.3. Cut the axle to seat tack welds.
       4.3.1. DO NOT cut into the axle tube when
       cutting the tack welds.

4.4. Adjust the axle so that dimension X1 is
   equal to dimension X2, and the axle is
   centered on the suspension and in the
   vehicle chassis (See Figure 10).
4.5. Verify there is 1.0" clearance between the
   S-cam and the top of the arm and 0.375"
   (3/8") between the S-Cam and axle seat
   (See Figure 11).

4.6. Inspect for any gap between the axle seat and
   axle when seated. The axle is to have contact
   with the seat, with no greater than 1/8" gap
   between the axle and one edge of the seat
   (See Figure 12). Verify the arm beams are
   parallel to each other, and the axle is
   perpendicular to the arm beams.
4.7. Tack weld the axle to the arm beams.
4.8. Verify the axle is properly centered on the suspension and in the vehicle chassis, the arm beams are parallel to each other, and the axle is perpendicular to the arm beams.

5. Fully weld the axle to the suspension as follows:
5.1. Remove the U-Bolts so that they are not damaged during welding.
5.2. Using a flap wheel or other appropriate tool remove any paint from all areas to be welded.
5.3. Clean the areas to be welded and remove all rust, grease, oil, dirt and/or debris.

Make sure all surfaces to be welded are clean and rust free bare metal.

5.4. Preheat the axle and seat weld areas per the axle manufacturer’s recommendation or see Figure 13 for recommended guidelines.

5.5. Verify the axle is properly centered on the suspension and in the vehicle chassis, the arm beams are parallel to each other, and the axle is perpendicular to the arm beams.

5.6. Weld as specified in Figure 13.
5.7. Install the U-bolts, and torque to specification (See Section 10 Torque Requirements).
7. Axle Alignment

The axle must be correctly aligned with the vehicle’s chassis for proper operation to occur. Alignment of the axle must be completed before the vehicle can be operated. Failure to correctly align the axle with the vehicle chassis may cause premature failure of the auxiliary axle suspension system, its components, and/or other vehicle components, and can lead to an accident, injury and/or death.

Watson & Chalin, Mfg. offers two different styles of pivot connections, with each having a different procedure to complete the axle alignment. Identify the style you have below, and then proceed to the corresponding section for the alignment procedure.

7.1. Weld Collar Style

1. Locate the vehicle on a flat level surface.
2. Secure the vehicle so that it cannot move by blocking the vehicle’s drive tires fore and aft.
3. Install the wheels and tires on the auxiliary axle suspension system.
4. Lower the auxiliary axle suspension system so that the tires contact the ground.
5. Release the brakes on the auxiliary axle suspension system.
6. Position the driver side arm beam pivot so that the alignment collar is in the center of the alignment slot on both the inboard and outboard side of the frame bracket.
7. Verify the driver side alignment collars are seated flush against the hanger side plates and the pivot fastener is perpendicular to the arm beam and frame bracket side plates.
8. Tack weld the driver side alignment collars to frame bracket in four (4) places, two (2) places on the outboard side, and two (2) places on the inboard side (See Figure 14).
9. On both sides of the vehicle, measure horizontally from the center line of the spindle of the vehicle’s front drive axle to the center line of the spindle of the pusher axle (or rear drive axle if aligning a tag axle).
10. Record the measurements.

11. Adjust the fore/aft position of the passenger side arm beam pivot so that the measurement from the drive axle spindle axis to the auxiliary axle spindle axis is equal on both sides of the vehicle plus or minus (+/-) 0.125” (1/8”) (See Figure 15).
12. If alignment cannot be achieved due to insufficient available pivot fore/aft travel on the passenger side of the vehicle, break the tack welds on the driver side alignment collar and adjust its position in the slot so that additional alignment range can be achieved.

13. Verify that proper alignment was achieved and is within the allowable tolerance.

14. Tack weld the passenger side alignment collar to the frame bracket in four (4) places, two (2) places on the inboard side, and two (2) places on the outboard side.

15. Verify that proper alignment was achieved and is within the allowable tolerance.

16. Weld all four (4) alignment collars into position as specified (See Figure 16).

17. If the pivot fastener is a cap screw or bolt and nut, it must be torqued to specification (See Section 10).

7.2. Eccentric Collar Style

1. Locate the vehicle on a flat level surface.
2. Secure the vehicle so that it cannot move by blocking the vehicles drive tires fore and aft.
3. Install the wheels and tires on the auxiliary axle suspension system.
4. Lower the auxiliary axle suspension system so that the tires contact the ground.
5. Release the brakes on the auxiliary axle suspension system.
6. Adjust all four (4) eccentric collars so that the adjustment square is positioned vertically below the pivot fastener (See Figure 17).
7. Snug tighten the driver side pivot fastener.
8. On both sides of the vehicle, measure horizontally from the center line of the spindle of the vehicle's front drive axle to center line of the spindle of the pusher axle (or rear drive axle if aligning a tag axle).
9. Record the measurements.
10. Using two (2) ½" break-over bars or ratchets, rotate the two (2) passenger side eccentric collars simultaneously to adjust the fore/aft position of the passenger side arm beam pivot so that the measurement from the drive axle spindle axis to the auxiliary axle spindle axis is equal on both sides of the vehicle plus or minus (+/-) 0.125" (1/8") (See Figure 15).
11. If alignment cannot be achieved due to insufficient available pivot fore/aft travel on the passenger side of the vehicle, loosen the driver side eccentric collar and adjust its position in the same manner so that additional alignment range can be achieved.
12. Verify that proper alignment was achieved and is within the allowable tolerance.
13. Snug tighten the passenger side eccentric collar.
14. Verify that the driver side inboard and outboard eccentric collars are aligned with each other (the adjustment squares are at the same orientation on both the inboard and outboard eccentric collars). (See Figure 18)
15. Torque both pivot fasteners to specification (See Section 10 Torque Requirements).

8. Air Controls

The auxiliary axle suspension system is actuated by the air control system. To activate (lower) the system, the load air springs are pressurized while the lift air springs are exhausted. To deactivate (raise) the system, the load air springs are exhausted while the lift springs are pressurized.

The air pressure supplied to the load springs is regulated to provide the proper weight carrying capacity for the intended load.

The air control system typically contains an air pressure gauge, air pressure regulator and, depending on operating preferences, a push/pull valve, toggle switch or electrical switch can be used to operate the system.

The regulator and gauge are used to adjust the pressure supplied to the load air springs for proper weight carrying capacity. Turning the regulator
knob in the clockwise direction will increase the pressure supplied to the load springs. Turning the regulator knob in the counter-clockwise direction will reduce the pressure supplied to the load springs.

For typical systems (See Figure 19), a chassis mounted push/pull valve is used to activate or deactivate the auxiliary axle suspension system. Per Figure 19, pushing the valve handle in will activate the auxiliary axle suspension system and lower the tires to ground. Pulling the valve handle out will deactivate the auxiliary axle suspension system and raise the tires away from the ground.

The chassis air pressure must reach 75psi minimum before the auxiliary axle suspension system can be operated. 75psi is the minimum pressure needed to operate the DOT required brake protection valve. The brake protection valve maintains safe air brake pressure in the event of air pressure loss downstream of the valve.

9. Air Pressure vs. Load

The following air pressure vs. load chart is to be used as a guide only (see Table 1). The actual air pressure required to support a given load depends on many factors related to the specific installation. To obtain an accurate air pressure vs. load calibration the suspension must be set up on a flat and accurate scale.
Table 1
Assumes 1500 lbs. ground weight with no (0) air pressure

<table>
<thead>
<tr>
<th>Ground Axle Load</th>
<th>Ride Height</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9&quot;</td>
</tr>
<tr>
<td>5,000 lbs.</td>
<td>15 psi</td>
</tr>
<tr>
<td>10,000 lbs.</td>
<td>36 psi</td>
</tr>
<tr>
<td>15,000 lbs.</td>
<td>58 psi</td>
</tr>
<tr>
<td>20,000 lbs.</td>
<td>79 psi</td>
</tr>
</tbody>
</table>

10. Torque Requirements

Torque specifications listed in the following tables apply to nuts, but not bolts, and all torque requirements shown are recommended for fasteners as supplied by Watson & Chalin, Mfg. For fasteners not supplied by Watson & Chalin, Mfg., contact component manufacturer for specifications.

10.1 Torque Guidelines

The following tables show the proper torque requirements for cap screws, u-bolts and nuts described.

Cap screw/bolt Torque Requirements

<table>
<thead>
<tr>
<th>Fastener</th>
<th>Size</th>
<th>UNC Grade 8 Lubricated Torque (lb.-ft.)</th>
<th>UNF Grade 8 Lubricated Torque (lb.-ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front Pivot – Hanger-to-Trailing Arm</td>
<td>1 1/8&quot;</td>
<td>965</td>
<td>1085</td>
</tr>
<tr>
<td>Axle Seat-to-Trailing Arm</td>
<td>1 1/8&quot;</td>
<td>965</td>
<td>1085</td>
</tr>
<tr>
<td>Crossmember</td>
<td>5/8&quot;</td>
<td>280</td>
<td>315</td>
</tr>
</tbody>
</table>

10.2 Torque Guidelines – U-Bolts

U-Bolts must be tightened as follows:

1. Thread all nuts onto the U-bolt so that the top of the nut is flush with the end of the leg.
2. Tighten all nuts in equal increments using the sequence shown until the nuts seat (See Figure 20).

NOTE
Torque values in Table 2 do not apply to air springs or lower grade fasteners.
3. For 0.375” (3/8”) and 0.50” (1/2”) U-bolts, torque to specification using the sequence shown (See Figure 20 and Table 3).

4. For 0.625” (5/8”), thru 1.125” (1-1/8”) U-bolts, torque to specification using the stepped procedure defined below:

4.1. Using the sequence shown in Figure 20, torque in 100lb.-ft. increments until the final torque specification is reached (See Table 3).

4.2. Decrease the torque step on the last increment as required to reach the specified torque (See Table 3)

U-Bolt Torque Requirements.

<table>
<thead>
<tr>
<th>Fastener</th>
<th>Size</th>
<th>UNC Grade 8 Lubricated Torque (lb.-ft.)</th>
<th>UNF Grade 8 Lubricated Torque (lb.-ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axle Seat U-bolts</td>
<td>3/4”</td>
<td>295</td>
<td></td>
</tr>
</tbody>
</table>

10.3 Torque Guidelines – Air Springs/Fittings

Air Spring Fastener Torque Requirements

<table>
<thead>
<tr>
<th>Size</th>
<th>Description</th>
<th>Max Torque Requirement (lb.-ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8”</td>
<td>UNC Blind Nuts</td>
<td>50</td>
</tr>
<tr>
<td>1/2”</td>
<td>UNC Bolt or Stud</td>
<td>25</td>
</tr>
<tr>
<td>3/4”</td>
<td>UNC Stud</td>
<td>55</td>
</tr>
<tr>
<td>3/4”</td>
<td>UNF Combo Stud</td>
<td>50</td>
</tr>
</tbody>
</table>

Air Spring Fitting Torque Requirements

<table>
<thead>
<tr>
<th>Size</th>
<th>Max Torque Requirement (ft./lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4” NPTF</td>
<td>50</td>
</tr>
<tr>
<td>1/2” NPTF</td>
<td>25</td>
</tr>
<tr>
<td>3/4” NPTF</td>
<td>55</td>
</tr>
</tbody>
</table>